BS EN 14488-1:2005

Testing sprayed concrete —

Part 1: Sampling fresh and hardened concrete

The European Standard EN 14488-1:2005 has the status of a British Standard

ICS 91.100.30

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

British Standards

Licensed Copy: sheffieldun sheffieldun, na, Tue Oct 31 07:23:04 GMT+00:00 2006, Uncontrolled Copy, (c) BSI

Licensed Copy: sheffieldun sheffieldun, na, Tue Oct 31 07:23:04 GMT+00:00 2006, Uncontrolled Copy, (c) BSI

National foreword

This British Standard is the official English language version of EN 14488-1:2005.

The UK participation in its preparation was entrusted by Technical Committee B/517, Concrete, to Subcommittee B/517/10, Sprayed concrete, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the *BSI Catalogue* under the section entitled "International Standards Correspondence Index", or by using the "Search" facility of the *BSI Electronic Catalogue* or of British Standards Online.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 7 and a back cover.

The BSI copyright notice displayed in this document indicates when the document was last issued.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 5 December 2005

© BSI 5 December 2005

ISBN 0 580 46499 7

Amendments issued since publication

Amd. No.	Date	Comments

Licensed Copy: sheffieldun sheffieldun, na, Tue Oct 31 07:23:04 GMT+00:00 2006, Uncontrolled Copy, (c) BSI

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 14488-1

June 2005

ICS 91.100.30

English version

Testing sprayed concrete - Sampling fresh and hardened concrete

Essais pour béton projeté - Échantillonnage de béton frais et de béton durci

Prüfung von Spritzbeton - Probenahme von Frisch- und Festbeton

This European Standard was approved by CEN on 17 April 2005.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

© 2005 CEN All rights of exploitation in any form and by any means reserved worldwide for CEN national Members.

Ref. No. EN 14488-1:2005: E

Licensed Copy: sheffieldun sheffieldun, na, Tue Oct 31 07:23:04 GMT+00:00 2006, Uncontrolled Copy, (c) BSI

Contents

page

1 Scope ... **4**

2 Normative references ... **4**

3 Principle ... **4**

4 Apparatus ... **4**

5 Procedures ... **4**

6 Identification of sample ... **6**

Bibliography ... **7**

Licensed Copy: sheffieldun sheffieldun, na, Tue Oct 31 07:23:04 GMT+00:00 2006, Uncontrolled Copy, (c) BSI

Foreword

This document (EN 14488-1:2005) has been prepared by Technical Committee CEN/TC 104 "Concrete and related products", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2005, and conflicting national standards shall be withdrawn at the latest by December 2007.

This European Standard is part of a series concerned with testing sprayed concrete.

This series EN 14488 *Testing sprayed concrete* includes the following parts:

— Part 1: Sampling fresh and hardened concrete

— Part 2: Compressive strength of young sprayed concrete

— Part 3: Flexural strengths (first peak, ultimate and residual) of fibre reinforced beam specimens

— Part 4: Bond strength of cores by direct tension

— Part 5: Determination of energy absorption capacity of fibre reinforced slab specimens

— Part 6: Thickness of concrete on a substrate

— Part 7: Fibre content of fibre reinforced concrete

This part does not supersede any other European Standard.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Licensed Copy: sheffieldun sheffieldun, na, Tue Oct 31 07:23:04 GMT+00:00 2006, Uncontrolled Copy, (c) BSI

1 Scope

This European Standard specifies a method for obtaining samples of fresh or hardened (i.e. before or after set) sprayed concrete, depending on the property to be measured and its associated test method.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 12350-1, *Testing fresh concrete — Part 1: Sampling*

EN 12504-1, *Testing concrete in structures - Part 1: Cored specimens - Testing, examining and testing in compression*

3 Principle

A sample of fresh or hardened sprayed concrete is extracted from either an in situ element or a test panel.

4 Apparatus

4.1 Scoop, or similar sampling device, made from a non-absorbent material not readily attacked by cement paste, suitable for taking increments of concrete.

4.2 Trowel, or similar cutting device, made from a non-absorbent material not readily attacked by cement paste, suitable for cutting a concrete sample from fresh, in situ sprayed concrete.

4.3 Moulds, of steel or other non-water-absorbing rigid material shall be used (a minimum of 4 mm steel sheet or 18 mm plywood). The minimum plan dimensions shall be 500 mm × 500 mm for hand spraying and 1 000 mm × 1 000 mm for robot spraying. The actual dimensions should be chosen taking into account the type, number and size of samples to be extracted (and avoiding the defective zone). The thickness should be appropriate to the size of test specimens to be cut from the panel, but shall not be less than 100 mm. Appropriate measures shall be taken to avoid entrapment of rebound in the mould (such as chamfered or slotted sides).

4.4 Coring or cutting equipment, suitable for extracting samples of sprayed concrete from a test panel or, where required in situ, to the required dimensions.

5 Procedures

5.1 General

Fresh samples may be extracted from the basic mix, the in situ material or from a test panel. Hardened samples may be cut from the in situ material or from a test panel. It should be noted that the properties at each of these locations may be different, due to the spraying process. The most appropriate sample type and location should be used, which will depend on the purpose of the quality control and on the specimens required for the property or properties to be measured.

A sample of fresh or hardened concrete is extracted in a manner suitable for the required test method.

Licensed Copy: sheffieldun sheffieldun, na, Tue Oct 31 07:23:04 GMT+00:00 2006, Uncontrolled Copy, (c) BSI

5.2 Obtaining a fresh sample from the basic mix

The basic concrete mix shall be sampled from the mixing pan or spraying pump or gun in a series of increments with a scoop, which are to be combined to form a homogenous sample, in accordance with EN 12350-1.

5.3 Obtaining a fresh sample from in situ sprayed concrete

The concrete or mortar shall be cut by trowel from the in situ sprayed material before initial set.

5.4 Making a test panel

The moulds shall be positioned within 20° of the vertical (unless another orientation has been specified, e.g. overhead) and sprayed with the same equipment, technique, layer thickness per pass and spraying distance as the actual work. The operator shall also be the same.

The panel shall be protected immediately against moisture loss using the same method as in the construction. The samples shall be marked for later identification (Mix, location, date and operator, see clause 6). The panel shall not be moved within 18 h of being sprayed, unless a shorter period is agreed between the parties. Curing shall continue thereafter under site conditions for at least 7 days or until samples are to be extracted.

5.5 Obtaining a fresh sample from a test panel

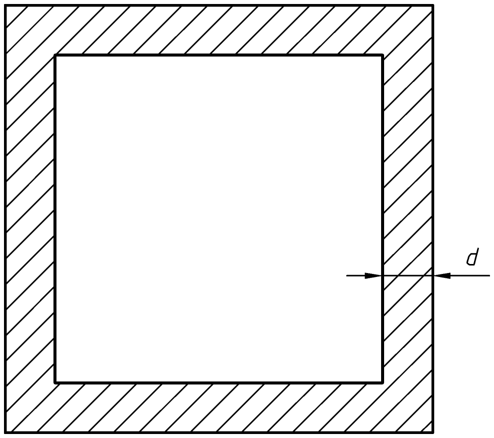
The concrete or mortar shall be cut from the test panel of sprayed material before initial set, and shall not include material within the defective zone, see Figure 1.

5.6 Obtaining a hardened sample from in-situ sprayed concrete

The test samples shall be obtained from the set in-situ sprayed material in accordance with EN 12504-1.

5.7 Obtaining a hardened sample from a test panel

The test samples shall be cored or sawn from the panel, and shall not include material within the defective zone, see Figure 1 (with the exception of the ends of beams for flexural and residual strength testing to prEN 14488-3, which may include such material, provided it does not intrude into the central 250 mm of the beam).



The width of the defective zone, d, is equal to the depth of the test panel.

Figure 1 — Defective zone of a test panel

6 Identification of sample

6.1 Fresh samples

Test specimens made from the fresh sample extracted from a test panel or in situ shall be marked with a waterproof ink or paint to indicate the mix, location, specimen orientation, date and operator.

6.2 Hardened samples

The test panel or sample extracted from the test panel or in-situ shall be marked with a waterproof ink or paint to indicate the mix, location, specimen orientation, date and operator.

Licensed Copy: sheffieldun sheffieldun, na, Tue Oct 31 07:23:04 GMT+00:00 2006, Uncontrolled Copy, (c) BSI

Licensed Copy: sheffieldun sheffieldun, na, Tue Oct 31 07:23:04 GMT+00:00 2006, Uncontrolled Copy, (c) BSI

Bibliography

[1] prEN 14488-3, *Testing sprayed concrete - Part 3: Flexural strengths (first peak, ultimate and residual) of fibre reinforced beam specimens*

Licensed Copy: sheffieldun sheffieldun, na, Tue Oct 31 07:23:04 GMT+00:00 2006, Uncontrolled Copy, (c) BSI

BSI — British Standards Institution

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level. It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover. Tel: +44 (0)20 8996 9000. Fax: +44 (0)20 8996 7400.

BSI offers members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

Buying standards

Orders for all BSI, international and foreign standards publications should be addressed to Customer Services. Tel: +44 (0)20 8996 9001. Fax: +44 (0)20 8996 7001. Email: orders@bsi-global.com. Standards are also available from the BSI website at http://www.bsi-global.com.

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Library and its Technical Help to Exporters Service. Various BSI electronic information services are also available which give details on all its products and services. Contact the Information Centre. Tel: +44 (0)20 8996 7111. Fax: +44 (0)20 8996 7048. Email: info@bsi-global.com.

Subscribing members of BSI are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration. Tel: +44 (0)20 8996 7002. Fax: +44 (0)20 8996 7001. Email: membership@bsi-global.com.

Information regarding online access to British Standards via British Standards Online can be found at http://www.bsi-global.com/bsonline.

Further information about BSI is available on the BSI website at http://www.bsi-global.com.

Copyright

Copyright subsists in all BSI publications. BSI also holds the copyright, in the UK, of the publications of the international standardization bodies. Except as permitted under the Copyright, Designs and Patents Act 1988 no extract may be reproduced, stored in a retrieval system or transmitted in any form or by any means – electronic, photocopying, recording or otherwise – without prior written permission from BSI.

This does not preclude the free use, in the course of implementing the standard, of necessary details such as symbols, and size, type or grade designations. If these details are to be used for any other purpose than implementation then the prior written permission of BSI must be obtained.

Details and advice can be obtained from the Copyright & Licensing Manager. Tel: +44 (0)20 8996 7070. Fax: +44 (0)20 8996 7553. Email: copyright@bsi-global.com.

BSI
389 Chiswick High Road
London
W4 4AL